

Call for Members of the Science Definition Team for the Arctic-COLORS Field Campaign

NASA is soliciting applications for members of the **Arctic-COastal Land Ocean inteRactions** (Arctic-COLORS) field campaign Science Definition Team (SDT). Response will take the form of a Letter of Application submitted to the Ocean Biology and Biogeochemistry Program Manager at NASA Headquarters.

1. Scope of the Program

Arctic-COLORS is a proposed NASA-funded field campaign designed primarily to quantify the biogeochemical response of the Arctic coastal environment to global change and anthropogenic disturbances – an imperative for developing mitigation and adaptation strategies for the region. The Arctic-COLORS represents the first attempt to study the nearshore coastal Arctic (from riverine deltas and estuaries out to the coastal sea) as an integrated land-ice-ocean-atmosphere-biosphere system. The overall objective of the proposed field campaign is to quantify the coupled biogeochemical/ecological response of the Arctic nearshore system to rapidly changing terrestrial fluxes and ice conditions, in the context of environmental (short-term) and climate (long-term) change. This focus on land-ice-ocean interactions in the nearshore coastal zone is a unique contribution of Arctic-COLORS compared to other NASA field campaigns in Polar Regions. Arctic-COLORS will focus on three overarching topics:

- I. The effects of land on nearshore Arctic biogeochemistry
- II. The effects of ice on nearshore Arctic biogeochemistry
- III. The effects of future change (warming land and melting ice) on nearshore Arctic biogeochemistry

Arctic-COLORS is not only timely to address scientific priorities of a rapidly changing Arctic, but also of high societal relevance as these changes have direct impacts on indigenous communities across the region. The proposed work would develop an improved understanding of the coastal Arctic and help better assess potential impacts to ecosystem services, emergency management, and decision support in the Arctic. The proposed field campaign is anticipated to provide linkages between previous NASA field activities studying the offshore Arctic Ocean and ongoing NASA field and synthesis activities, including ABoVE which is focusing on Arctic land processes, river chemistry, and terrestrial fluxes. Arctic-COLORS is also synergistic to other national and international Arctic activities.

2. Science Definition Team for Arctic-COLORS

The SDT will be charged with developing detailed study designs for the Arctic-COLORS field campaign; this will include discussing and refining implementation scenarios detailed in the Arctic-COLORS [Science Plan](#), as well as logistical and field sampling approaches. Modifications to the science questions and minor rescopes may be considered if there is an impact to the relevance of the study and/or to better align objectives to current and future Ocean Biology and Biogeochemistry (OBB) Program priorities.

The plan should include a reasonably detailed study design or implementation options with a modular approach, and a description of required field and remote sensing observations, required field infrastructure, logistics, technologies, modeling, and data management capabilities. The work of the SDT will culminate in a report that will serve as the Arctic-COLORS Implementation Plan that

NASA will use to guide its implementation of the field campaign (see for example the [EXPORTS Implementation Plan](#)).

This study should leverage, complement, and be compatible with past, ongoing, and planned research projects and field observations of national and international organizations working in the region, where possible. Where collaboration is possible, the NASA field campaign can then focus on filling gaps in scientific or geographic coverage and providing integrated regional analyses through effective use of satellite remote sensing, in situ observations, geospatial data analysis tools, and integrative data synthesis and modeling studies.

2.1 Arctic-COLORS SDT Responsibilities

The Arctic-COLORS Science Definition Team (SDT) members will spend approximately nine (9) to twelve (12) months developing the plan. The SDT is expected to conduct most of its business virtually over the months following SDT selection, with one in-person meeting anticipated to take place about halfway through the working period. NASA will support travel expenses for any Arctic-COLORS SDT related work. Salary and other financial support will not be provided to SDT members. All reports and other output of the Arctic-COLORS SDT will be made publicly available on the [Arctic-COLORS website](#). Once the SDT's work has concluded, it will be disbanded prior to any solicitations for the field campaign being issued by NASA.

2.2 SDT Structure and Composition

The SDT will consist of approximately 8-20 members with expertise in scientific and social disciplines relevant to the goals of Arctic-COLORS. These include, but are not limited to, carbon cycle science, aquatic and terrestrial ecology of polar regions, biogeochemistry, climate change, arctic indigenous communities, social and economic sciences, land-ocean interactions. Members will also have expertise in the methodologies to be used: satellite, airborne, and in situ observations; data analysis; data synthesis; data management; and modeling. It will be desirable for members of the SDT to have some knowledge of and experience in working in the Arctic. NASA will be looking for members who have a demonstrated ability to work well as constructive, engaged members of a collaborative, interdisciplinary team. NASA Program Managers and other agency representatives, as needed, will be ex officio members of the Arctic-COLORS SDT. NASA is also anticipating having representation from Arctic indigenous communities in the SDT.

NASA is also seeking partnerships with other organizations to conduct Arctic-COLORS. Thus, there is the possibility NASA may ask its Arctic-COLORS SDT members to also engage in the scientific and implementation planning for any potentially combined activities and work with the scientists representing the scientific interests of the partner organizations. NASA is not anticipating that such interactions will add significantly to the burden of work to be undertaken by the Arctic-COLORS SDT.

2.3 Arctic-COLORS SDT Membership Application

Applications for membership in the Arctic-COLORS SDT must be in the form of a Letter of Application which should provide evidence of expertise and knowledge of the applicant in areas highly relevant to the Arctic-COLORS scientific goals and related research activities. All applicants must explain the knowledge and skills they have to offer and why their contributions would be important for SDT activities. All applicants should have read and be familiar with the Arctic-COLORS [Science Plan](#). Letters of application should provide a brief statement regarding which

aspects of the Arctic-COLORS objective and science questions the applicant would be able to help develop, as well as their overall vision regarding the scientific and societal direction and scope of the field campaign.

The letter may contain a brief list of references to scientific or technical papers the applicant has published and/or positions held and work conducted that establish her/him as a leader in their area(s) of expertise. The Letter should also contain a statement of how much time the applicant will commit over the next nine to twelve months for activities related to the Arctic-COLORS SDT, particularly if there are any major constraints that may restrict full engagement in the work that will be required to develop the implementation study design for the Arctic-COLORS field campaign. This statement could take the form of a brief institutional letter/statement of commitment from the applicant's management to support the PI's participation/salary during the SDT activities.

Letters of applications are invited from individuals, not groups. Collaborations and teams are not solicited. Each Letter is to be limited to three pages, with 11-point (or larger) font, one-inch margins, and single line spacing. Applications are required to be submitted by E-mail to Laura Lorenzoni (laura.lorenzoni@nasa.gov) with the subject line "NASA Arctic-COLORS SDT Application." Applications must be received no later than 5:00 PM Eastern time on December 2, 2022. Applications from international organizations/investigators are welcome on a no-exchange-of-funds basis.

3. Selection of the Arctic-COLORS Science Definition Team

NASA expects to announce its selection of SDT members in January 2023 after internally reviewing the letters received in response to this invitation.